

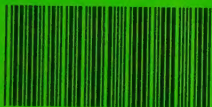
Data General Corporation, Westboro, Massachusetts 01580

Customer Documentation

Hardware Supplement for *The* *486 System User's* *Manual and The 486* *System Guide*

042-000290-01

MP MASTER



MA25713

Hardware Supplement for *The 486 System User's Manual and The 486 System Guide*

042-000290-01

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Printed in the United States of America
Rev. 01, July 1993
Ordering No. 042-000290

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Hardware Supplement for *The 486 System User's Manual* and *The 486 System Guide*, 042-000290-01

Revision History:

Original Release – October, 1992

First Revision – July 1993

A vertical bar in the margin of a page indicates substantive technical change from the previous revision.

About This Supplement

This supplement, intended for use with *The 486 System User's Manual* or *The 486 System Guide*, provides additional information on hardware removal and installation procedures. Before you begin, find *The 486 System User's Manual* or *The 486 System Guide*. This supplement assumes you have a copy of the primary 486 system manual to read for installation procedures and information on options and jumper settings.

Telephone Assistance

If you are unable to solve a problem using any manual you received with your system, free telephone assistance is available with your hardware warranty and with most Data General software service options. If you are within the United States or Canada, contact the Data General Customer Support Center (CSC) by calling 1-800-DG-HELPS. Lines are open from 8:00 a.m. to 5:00 p.m., your time, Monday through Friday. The center will put you in touch with a member of Data General's telephone assistance staff who can answer your questions.

For telephone assistance outside the United States or Canada, ask your Data General sales representative for the telephone number.

Avoiding Electrostatic Discharge (ESD) Damage

The cover(s) and filler panel(s) installed on your equipment protect the electronic circuits inside the equipment from electrostatic

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discharge (ESD) damage. However, when you remove these covers and filler panels to replace or install subassemblies, you can inadvertently damage the sensitive electronic circuits in the equipment by simply touching them. Electrostatic charge that has accumulated on your body discharges through the circuits. If the air in the work area is very dry, running a humidifier in the work area will help decrease the risk of ESD damage. You must follow the procedures below to prevent damage to the equipment.

CAUTION: *Read and understand the following instructions before you remove the cover(s) or panel(s) from the equipment.*

- Provide enough room to work on the equipment. Clear the work site of any unnecessary materials or materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar materials.
- Do not remove replacement or upgrade subassemblies from their antistatic packaging until the exact moment that you are ready to install them.
- Gather the tools, manuals, an ESD kit, and all other materials you will need before you remove covers and panels from the equipment. Procedures for removing subassemblies usually list required materials at the beginning. After you remove a cover or panel, you should avoid moving away from the work site; otherwise, you may build up an electrostatic charge.

- Use an ESD kit when handling circuit boards or when touching the electronic circuits inside the equipment. If you don't have an ESD kit, you can order one from Data General. If an emergency arises and an ESD kit is not available, follow the procedures in the "Emergency Procedures (without an ESD kit)" section.
- Replace the cover(s) or panel(s) on the equipment as soon as possible so that the electronic circuits are protected.
- If the equipment has an opening for an optional device (such as a mass-storage drive), and the device is not installed, make sure a filler panel is installed in the opening before connecting the equipment to the ac power outlet.

Emergency Procedures (without an ESD kit)

In an *emergency* when an ESD kit is not available, use the following procedures to reduce the possibility of an electrostatic discharge by ensuring that your body and the subassembly are at the same electrostatic potential.

CAUTION: *These procedures are not a substitute for the use of an ESD kit. Follow them only in the event of an emergency.*

- Before touching any electronic circuits or boards inside the equipment, firmly touch a bare (unpainted) surface of the equipment.
- Before removing any replacement or upgrade subassembly from its antistatic bag, place one hand firmly on an unpainted surface of the chassis, and at the same time, pick up the replacement or upgrade subassembly while it is still sealed in

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the antistatic bag. Once you have done this, *do not* move around the room or contact other furnishings, personnel, or surfaces until you have installed and *secured* the subassembly in the equipment.

- Remove the subassembly from the antistatic bag, handling printed circuit boards by the edges. Avoid touching components and circuits on a printed circuit board.
- If you must move around the room or touch other surfaces before securing the subassembly in the equipment, first place the subassembly back in the antistatic bag. When you are ready again to install the subassembly repeat these procedures.
- Order an ESD kit from Data General for the next time you need to add or remove a cover or panel.

End of Preface

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Hardware Supplement

This supplement to *The 486 System User's Manual* and *The 486 System Guide* provides additional information on the hardware configuration for your personal computer (PC). The supplement covers the following topics:

- Removing the drive compartment
- Installing a 3.5-inch SCSI or IDE drive in a 5.25-inch drive bay
- Removing and replacing the power supply
- Removing and replacing the system board
- Operating specifications
- Recording information about the PC

Before beginning any procedure described here, please read through all the steps to ensure that you are completely prepared.

Assemble the components you intend to install, and read the instructions that you received with the components.

WARNING: Before you remove, install, or replace any component, be sure to turn off power to the system unit and unplug all cables.

Near the end of this supplement, there is a worksheet you can use to record information about your PC. Be sure to fill out the

worksheet as soon as possible. This information can be very helpful if you should need technical support.

Removing the Drive Compartment

You must remove the drive compartment if you want to install or replace a drive within the compartment, or if you need to replace the power supply or the system board.

Open the system unit as described in *The 486 System User's Manual* or *The 486 System Guide*.

To remove the drive compartment:

1. Unplug all cables to any drives already installed in the drive compartment.
2. Grasp the front of the drive compartment and with your other hand press the securing tab (Figure 1) to the right; then slide the drive compartment out of its enclosure.
3. Lift the drive compartment to remove it from the chassis. See Figure 1.

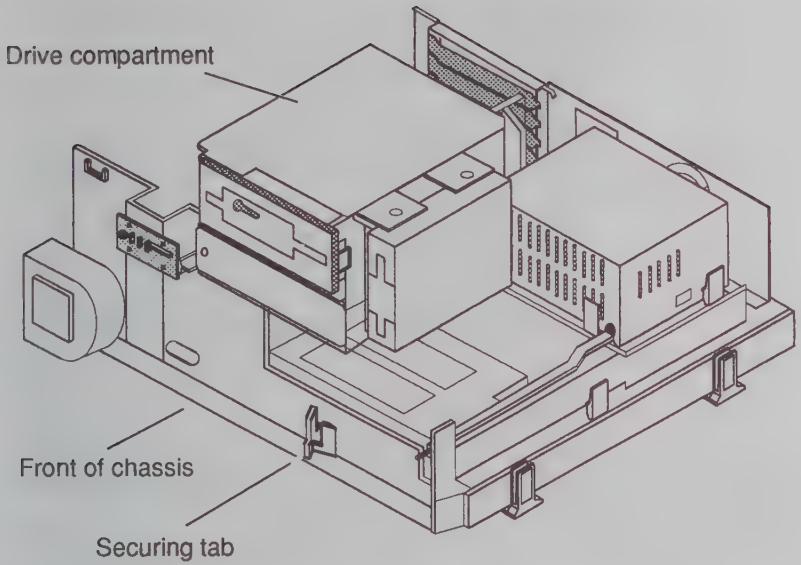


Figure 1 Removing the Drive Compartment

Installing a 3.5-Inch Device in a 5.25-Inch Drive Bay

The drive compartment contains two bays, each of which can accommodate either a 5.25-inch device or a 3.5-inch device fitted with an adapter kit.

Because the drive bays are wide enough to accommodate a 5.25-inch device, 3.5-inch devices require an adapter kit. Your system includes an adapter kit for each IDE drive; SCSI drives typically come already adapted for your system. The kit provides side mounting brackets which let you secure the narrow device to the wider drive compartment.

If the peripheral already has side mounting brackets in place, skip to the section called “Attaching the Adapted Device to the Drive Compartment.”

The next sections describe how to attach the mounting brackets. The location of the brackets varies depending on whether the device is an IDE drive or a SCSI drive.

Attaching Mounting Brackets to an IDE Drive

To attach each mounting bracket to an IDE drive

1. With the flat part of the metal bracket facing downward, place the bracket to the side of the IDE device.
2. Align the front slot on the bracket with the first hole near the front of the device. Insert a screw in this position and tighten enough to hold the bracket to the drive.

3. Insert a second screw through the middle slot on the bracket into the hole near the center of the side of the device. Tighten this screw enough to hold the bracket in position.
See Figure 2.

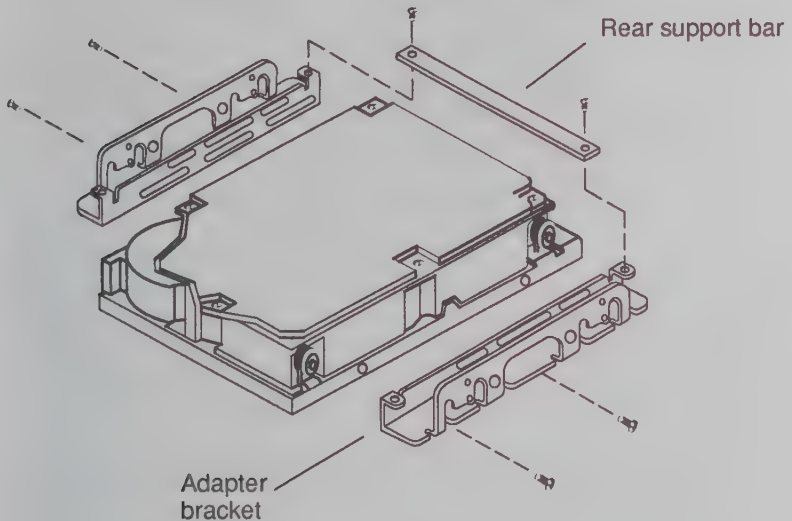


Figure 2 Attaching Adapter Brackets to a 3.5-Inch IDE Drive

4. Slide the bracket toward the back of the drive so that the front screw is flush with the front of the first slot in the bracket. Tighten the screws to hold the bracket firmly in this position.
5. Repeat steps 1 through 4 for the second bracket.
6. Attach the rear support bar to the brackets at the rear of the device.

For directions on how to attach the bracketed drive to the drive compartment, continue with the section, “Attaching the Adapted Device to the Drive Compartment.”

Attaching Mounting Brackets to a SCSI Drive

Some SCSI devices come with the mounting brackets already attached. If your device has mounting brackets already attached, skip this section and continue with the next section, “Attaching the Adapted Device to the Drive Compartment.”

To attach mounting brackets to a SCSI drive

1. With the flat part of the metal bracket facing downward, place the bracket to the side of the SCSI device.
2. Align the front slot on the bracket with the first hole near the front of the device. Insert a screw in this position and tighten enough to hold the bracket to the drive.
3. Insert a second screw through the rear slot on the bracket into the hole near the rear of the device. Tighten this screw enough to hold the bracket in position. See Figure 3.

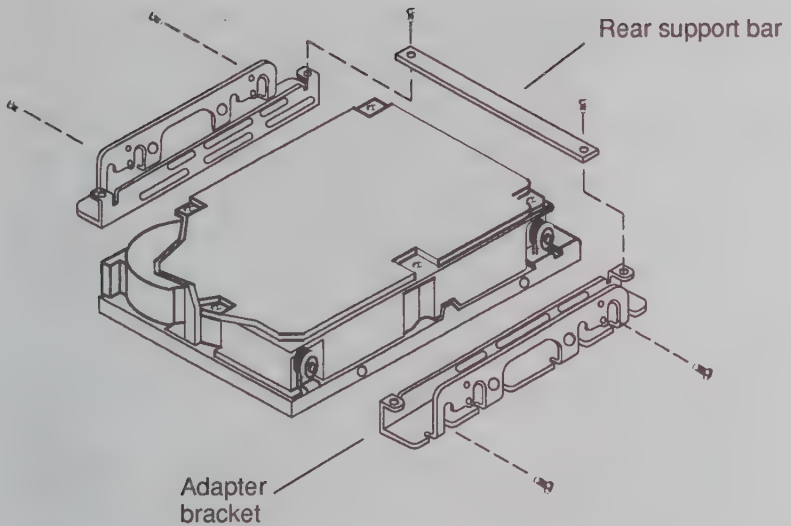


Figure 3 Attaching Adapter Brackets to a 3.5-Inch SCSI Drive

4. Slide the bracket toward the back of the drive so that the front screw is flush with the front of the first slot in the bracket. Tighten the screws to hold the bracket firmly in this position.
5. Repeat steps 1 through 4 for the second bracket.
6. Attach the rear support bar to the brackets at the rear of the device.

For directions on how to attach the bracketed drive to the drive compartment, continue with the next section.

Attaching the Adapted Device to the Drive Compartment

Once the 3.5-inch device is equipped with mounting brackets, you can install the drive into the drive compartment. If both bays are empty, you should install the first device in the bottom bay.

1. Loosen the four screws that attach the 3.5 inch floppy diskette drive to the right side of the drive compartment. Remove the floppy diskette drive and set it aside.
2. With the front of the drive facing forward (and the cable connections to the rear), slide the drive into the drive compartment.
3. Align the holes on the side of the drive compartment with the holes in the mounting brackets. See Figure 4.
4. Attach the bracketed drive to the drive compartment with two screws on each side (after removing the 3.5-inch drive, if installed).

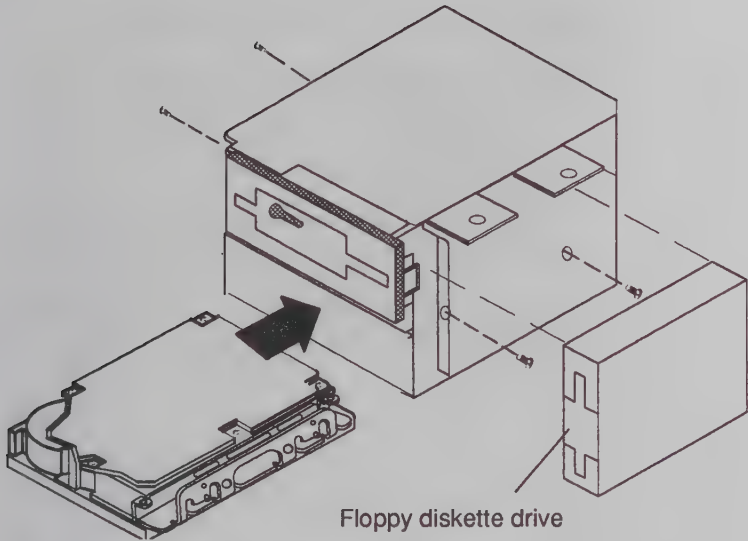


Figure 4 Attaching the Bracketed Drive to the Drive Compartment

5. Place the drive compartment onto the front of the chassis and slide the unit back into place.
6. Attach the data cable and power supply connector to the back of the drive(s).
7. Reattach the floppy diskette drive (removed in Step 1) to the right side of the drive compartment.

Remember to run the **SETUP** utility and enter the appropriate information for the new device. See *The 486 System User's Manual* or *The 486 System Guide* for information about **SETUP**.

Removing the Power Supply

You must remove the power supply from the system unit if you want to replace a failed power supply or if you need to replace the system board.

WARNING: Before you open the system unit, be sure to turn off ac power and unplug all cables.

The power supply sits at the right rear of the chassis when viewed from the front of the system unit. See Figure 5.

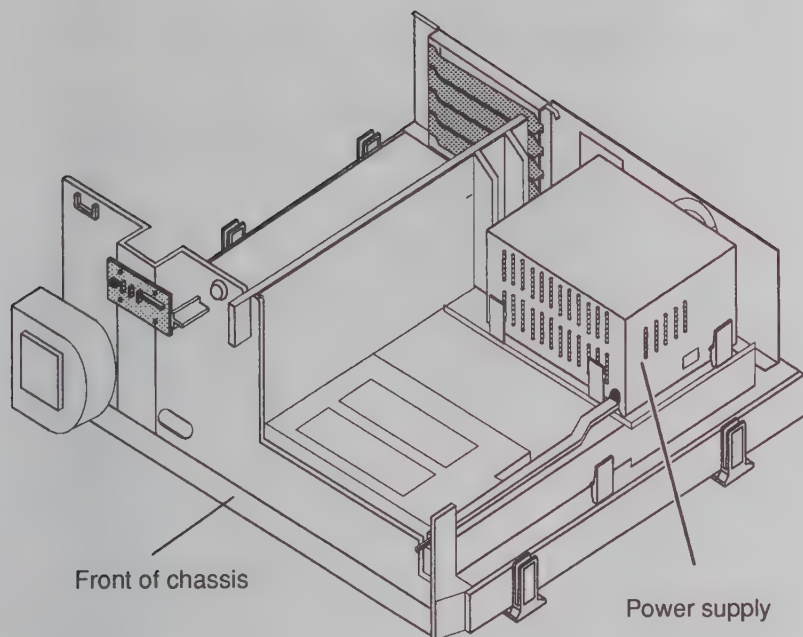


Figure 5 Location of the Power Supply

To remove the power supply

1. Remove the drive compartment (as described earlier in this supplement).
2. Disconnect the power connectors from the system board. The power connectors fit on the system board in only one way; note the positions of the connectors.
3. Disconnect the power supply cables from each drive.
4. Gently release the plastic clip near the right center of the power supply assembly (which also contains the primary fixed disk drive). See Figure 6.

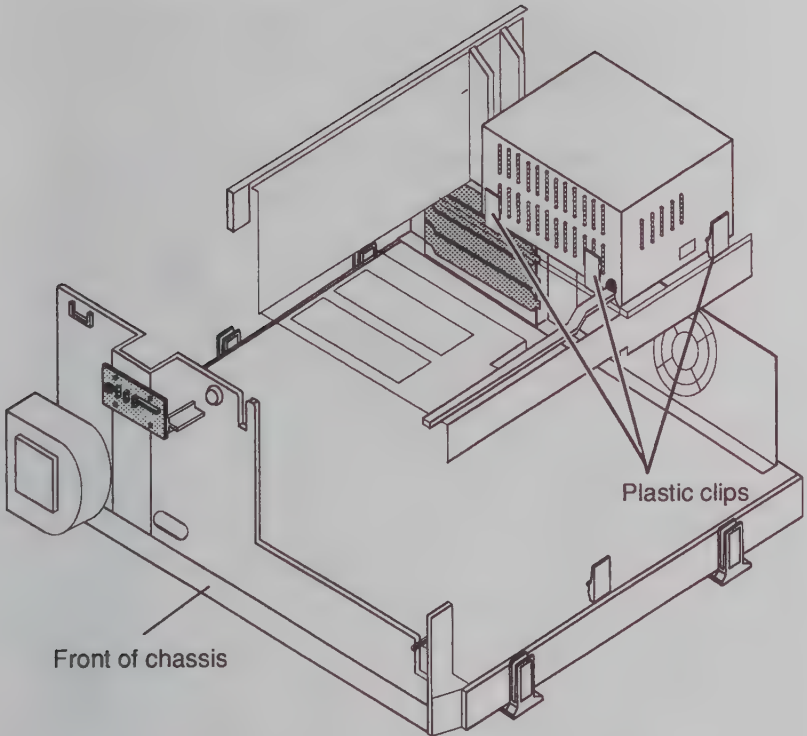


Figure 6 Releasing the Power Supply Assembly

5. Carefully lift the power supply assembly from the chassis. Be sure that the cables from the system board do not snag as they pass through the opening in the center of the assembly base.
6. Slide the plastic link bar (shown in Figure 7) toward the front of the assembly so that it disengages from the rubber sleeve on the front of the power supply.

7. Four clips hold the power supply to the base: two clips on the front, and one clip on each side toward the back. Release the front clips, lift the power supply slightly, and then disengage the unit from the back clips.

You can now lift the power supply from the chassis as shown in Figure 7.

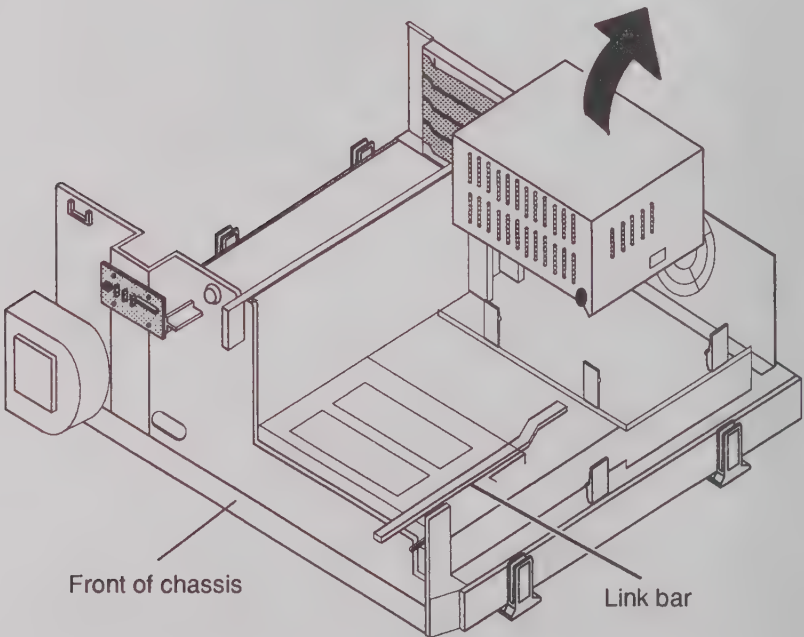


Figure 7 Removing the Power Supply Unit from the Assembly

Replacing the Power Supply

To install a new power supply, perform the steps in the previous section in reverse order.

Be sure the AC voltage switch is set properly. Set the switch to 115V for use in North America, or to 230V for other continents. To change the setting, use a ballpoint pen or paper clip to slide the switch so that the proper voltage appears. See Figure 8.

CAUTION: *Before installing the new power supply, you must make sure that the AC voltage selection switch on the back of the power supply is set properly.*

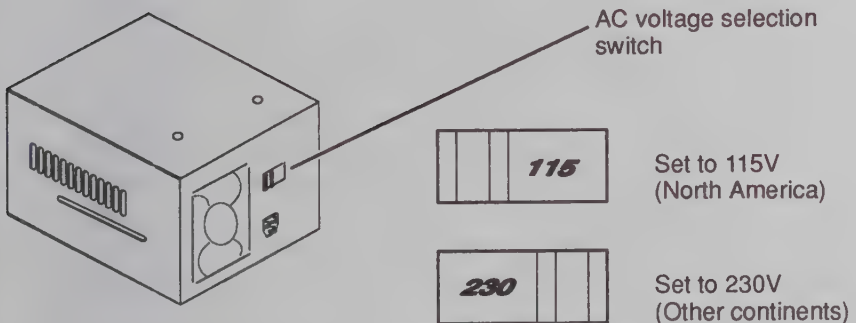


Figure 8 Setting the AC Voltage Switch on the Power Supply

Be sure the power supply is held securely to its base by all four clips.

When replacing the power supply assembly into the chassis, carefully run the drive cables from the system board up through the opening in the center of the assembly base. A supporting pin in the base of the assembly must fit into a hole near the center of the system board.

Removing the System Board

The system board sits at the bottom of the chassis. To remove the system board, you must remove the disk drive compartment and the power supply assembly. You must also disconnect several cables and connectors. This section describes how to perform each of these tasks, or tells you where to turn for more information.

WARNING: Before you open the system unit, be sure to turn off AC power and unplug all cables.

CAUTION: Be sure to protect against electrostatic discharge (ESD) damage. Before you handle any board, touch an unpainted **metal** part of the chassis for a few seconds to discharge static electricity. You can also wear an ESD grounding strap, available at most electronic component stores.

Follow these steps to remove the system board.

1. Remove the disk drive compartment from the chassis, as described earlier in the section “Removing the Drive Compartment.”
2. Remove the entire power supply assembly from the chassis, as described earlier in the section “Removing the Power Supply.”

3. Disconnect the power cables and data cables from the system board.
4. Disconnect the two connectors at the front left of the system board. See Figure 9.

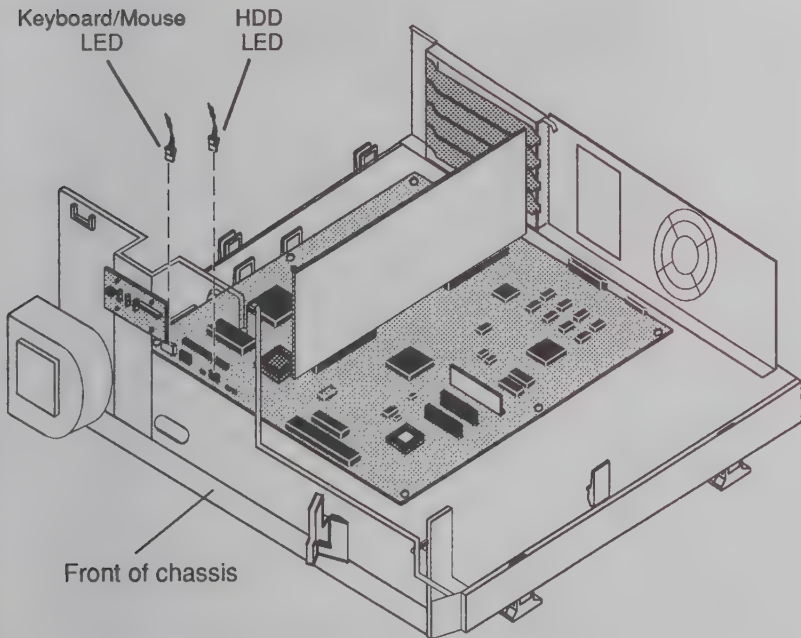


Figure 9 Removing Connectors from the Front of the System Board

5. Remove the metal back plate by lifting it straight up. See Figure 10.

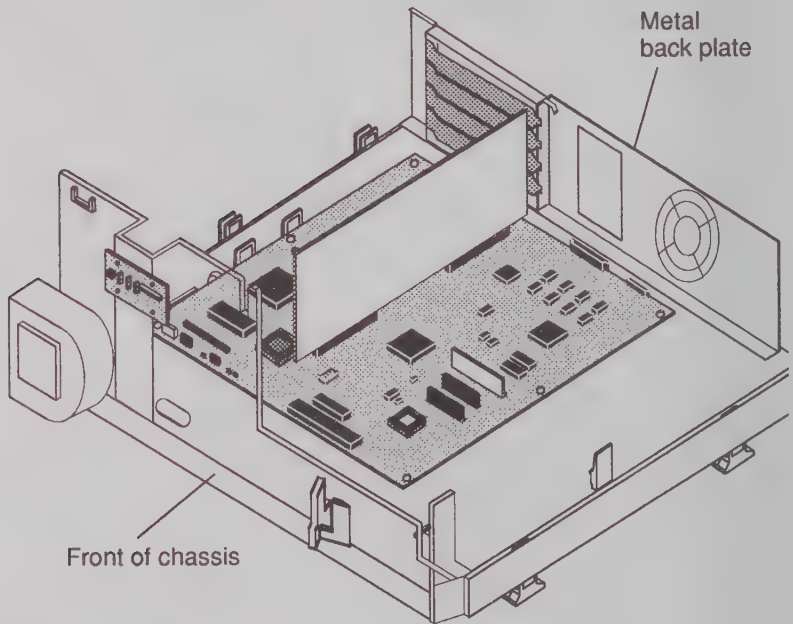


Figure 10 Removing the Metal Back Plate

6. While holding the right end of the metal bracket that is attached to the rear of the system board, raise the board slightly. Then slide the board to the right so that the left edge of the board moves under the retaining clips on that side. See Figure 11.

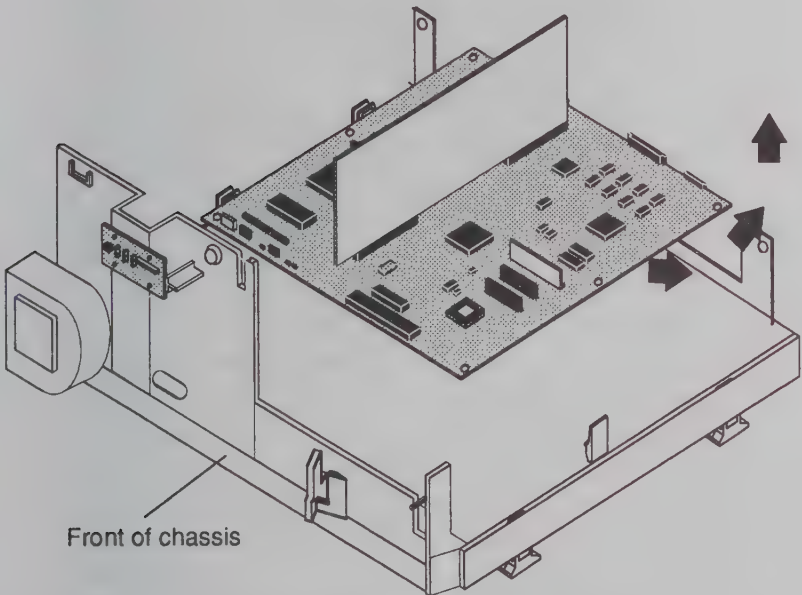


Figure 11 Releasing the System Board

You can now remove the board from the chassis.

7. Hold the riser card by its top edge and pull the board from the connector on the system board. See Figure 12. Place the riser card on an ESD mat.

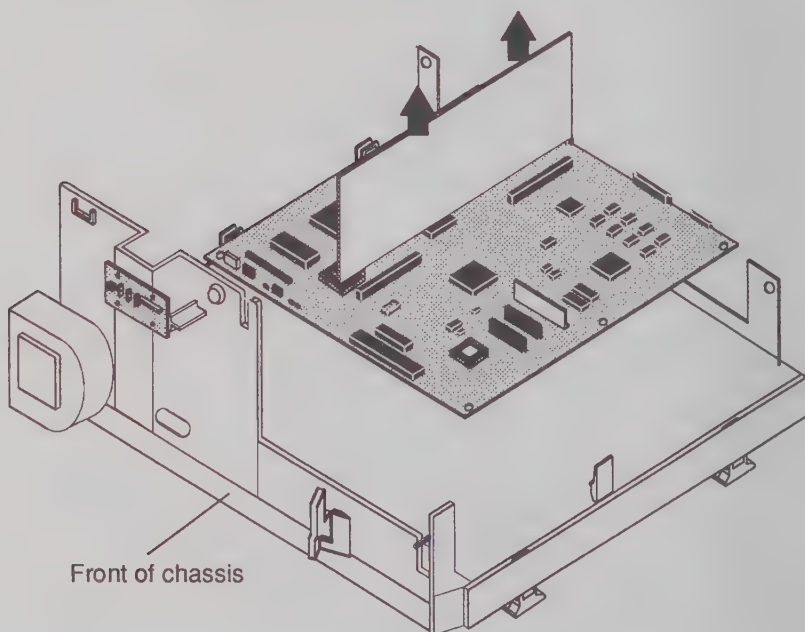


Figure 12 Removing the Riser Card from the System Board

8. Place the system board on an ESD mat.

Transferring Options and Settings to the New System Board

If you are replacing the system board, you must transfer options and jumper settings from the old system board to the new system board. Follow these steps.

1. Place the old and new system boards side by side on an ESD mat.
2. Open *The 486 System User's Manual* or *The 486 System Guide* to the section named "System Board Layout." Use this section to find the options and jumper banks mentioned next.
3. Check the old system board for the options on the following list. Place a mark next to any option that you locate.
 - ☐ SIMM memory
 - ☐ VGA Memory upgrade
 - ☐ 80487SX coprocessor (in systems upgraded from 486SX only)
 - ☐ Second-level cache
4. Remove from the old system board any options that you located in Step 3.

NOTE: For systems that have upgraded from a 486SX to a 80487SX coprocessor, you must swap the 486SX that ships installed in the new board with the 80487SX coprocessor in the old board.

The 486SX (that ships with the new board) *must* be installed in the old board that you return for repair.

Install these options in the new system board. Refer to sections in *The 486 System User's Manual* or *The 486 System Guide* and this supplement for removal and installation procedures.

5. Jumper settings on the new system board must match the settings on the old system board. Follow these steps to ensure that the new system board has the same jumper settings as the old board.
 - a. Locate and write down the settings of all the jumper banks on the old system board. To find the jumpers and read their settings, refer to the section "Jumper Settings" in *The 486 System User's Manual* or *The 486 System Guide*.
 - b. Reset (as needed) jumper settings on the new system board to match the jumper settings on the old system board.

Follow procedures in the next section to replace the old system board.

Replacing the System Board

Before you replace the system board, be sure that you transfer options and jumper settings from the old system board to the new one. Refer to steps in the "Transferring Options and Settings to the New System Board" section of this supplement.

To replace the system board, reverse the steps in the previous section.

Be sure the system board is securely held on its left side by the retaining clips. When replacing the riser card on the system board, be sure the card is firmly seated in the connector on the system board.

When replacing the metal back panel, slide it into place so that the two vertical slots in the panel fit over the vertical plastic tabs at the back of the chassis.

Replace all cables, the power supply chassis, and the drive compartment (as described earlier in this supplement).

CAUTION: *Be sure to protect against electrostatic discharge (ESD) damage. Before handling a board, touch an unpainted **metal** part of the chassis for a few seconds to discharge static electricity. You can also wear an ESD grounding strap, available at most electronic component stores.*

Operating Specifications

This section lists the power, temperature, and humidity ranges of the PC system.

Power Specifications

This system has a 145-watt switchable power supply.

Input		
Frequency Range	Ac Voltage Range	Ac Current
47 Hz to 63 Hz	100 through 120 V	5 A
	200 through 240 V	3 A

Output		
Output Voltage	Minimum Current	Maximum Current
+ 5 V	3.0 A	18 A
- 5 V	0 A	.3 A
+ 12 V	0 A	4.2 A
- 12 V	0 A	.3 A

Temperature and Humidity

Operating temperature 10° C to 35 C (50° F to 95° F)

Humidity 20% to 80%, noncondensing

Recording Information About the PC

On the next page is a worksheet that you can use to record important information about your personal computer and its configuration. This information can be helpful if you need to request technical assistance.

Fill out the worksheet as soon as possible. Much of the information is available directly through the SETUP utility described in the software configuration section of the *486 System User's Manual* or *The 486 System Guide*. After you record the details given in the SETUP display, you'll have the information at hand even if a problem prevents you from starting the PC or running the SETUP utility.

You can determine the drive type by the model number that appears on the label attached to the drive.

Model Number	Drive Type
CP 3000	17
CP 3044	17
CP 30104	74 (or 40)
CP 3204F	46
CP 30084E	55
CP 30174E	94
CP 30254	53

PC Information Worksheet

Use this worksheet to record information about your 486 personal computer. Refer to this information when contacting technical support, or when removing or installing hardware.

PC Information Worksheet		Page 1	
Model		Serial No.	
Disk Drives			
Floppy Drive A	☐ 3.5 720KB	☐ 5.25 360KB	☐ Not installed
	☐ 3.5 1.44MB	☐ 5.25 1.2MB	
Floppy Drive B	☐ 3.5 720KB	☐ 5.25 360KB	☐ Not installed
	☐ 3.5 1.44MB	☐ 5.25 1.2MB	
Fixed Drive 0	Type	MB	☐ Not installed
Fixed Drive 1	Type	MB	☐ Not installed
Memory			
Total Memory	Base Memory	KB	
KB	Extended Memory	KB	
Math Coprocessor			
	☐ Installed	☐ Not installed	

PC Information Worksheet Page 2**Shadow RAM**

System BIOS ☐ Enable ☐ Disable
Video ☐ Enable ☐ Disable

Security

Diskette Drive Control ☐ Normal ☐ Disable ☐ Write protect
Fixed Disk Drive Control ☐ Normal ☐ Disable ☐ Write protect
Diskette Boot Control ☐ Auto ☐ A: ☐ C:

Serial Port 1 ☐ Enable ☐ Disable

Serial Port 2 ☐ Enable ☐ Disable

Parallel Port ☐ Enable ☐ 3BCh ☐ 378h ☐ 278h

☐ Disable

Power On Password Type ☐ Power on ☐ Network

Power On Password Status ☐ No Password ☐ Password assigned

Setup Password Status ☐ No Password ☐ Password assigned

Key number

PC Information Worksheet Page 3

Communications Status

Baud Rate BPS Stop Bits ☐ 0 bits ☐ 1 bit

Parity ☐ Odd ☐ Even Data Length ☐ 7 bits ☐ 8 bits

Processor Memory Use

0F00000H:0FFFFFFH—

User-installed Options

Coprocessor and CPUs

487SX Coprocessor	☐ Installed	☐ Not installed
486DX/33 CPU	☐ Installed	☐ Not Installed
486DX2/50 CPU	☐ Installed	☐ Not Installed
486DX2/66 CPU	☐ Installed	☐ Not Installed

Video Memory

512K Memory Upgrade ☐ Installed ☐ Not Installed

System Memory

4MB SIMM Upgrade (Qty.:)	☐ Installed	☐ Not Installed
8MB SIMM Upgrade (Qty.:)	☐ Installed	☐ Not Installed
16MB SIMM Upgrade (Qty.:)	☐ Installed	☐ Not Installed

Primary Display

☐ Monochrome ☐ CGA 40x25 ☐ CGA 80x25 ☐ Special card

End of Manual

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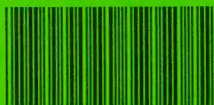
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